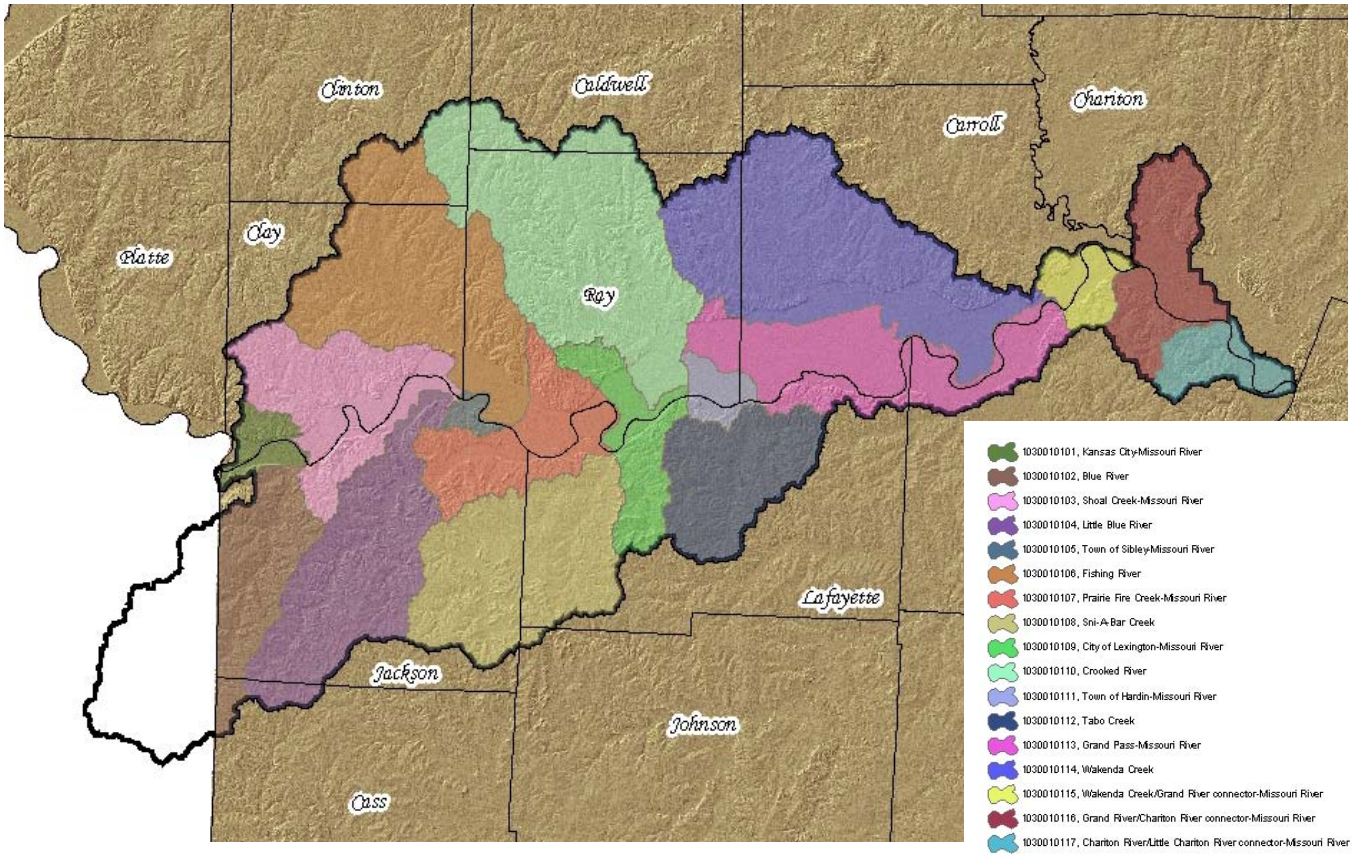
# *Conservation Security Program Sub-basin*
# *Lower Missouri – Crooked, 10300101*

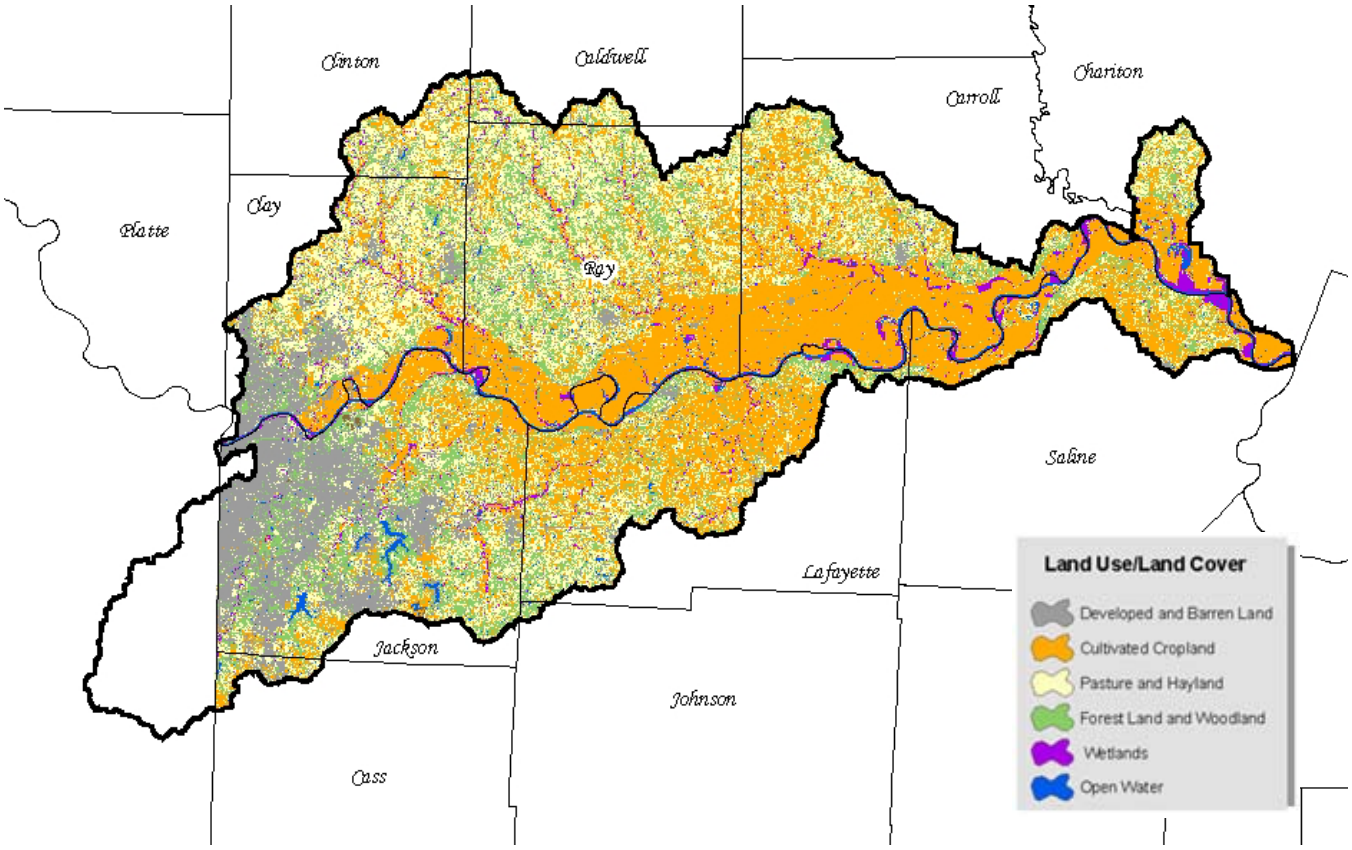



Missouri's 8-Digit Sub-basins

The Lower Missouri - Crooked River sub-basin extends across portions of ten counties in west central Missouri, covering 2,588 square miles. Straddling the Missouri River, the drainage area extends eastward from Kansas City on its western edge to Howard County in central Missouri. Here, the Missouri River alluvial plain drastically narrows as the river begins its' eastern traverse across the northern fringes of the Ozark Highlands to the Mississippi River just north of St. Louis, Missouri. The northern third of the sub-basin is moderately broad to gently rolling dissected plains with local relief decreasing away from the rugged, loess capped hills along the Missouri River alluvial plain. Unlike the Grand River sub-basin to its north, there is very little glacial till and existing deposits thin rapidly from east to west. Land use transitions from predominantly cool season pastures on the west side to a mix of cultivated crops and pastureland covering the eastern portion. The central third of the sub-basin consists of the alluvial plain and channel of the Missouri River covered with fine textured, poorly drained soils. The narrow western end of this alluvial plain, originally heavily forested with scattered wetland prairies, is now a mix of urban development and cropland. The alluvial plain broadens extensively from south-central Ray County to the confluence of the Missouri and Grand Rivers. Bounded by low bluffs, these broad bottoms, once covered with wet prairies and marshland, are now levied and intensively row cropped. The eastern portion of the alluvial plain is narrower and the historic mix of wet prairies and bottomland forests has given way to cropland and several large public wetland areas. The southern third of the sub-basin is situated between the Missouri River and the Blackwater River drainage. From the narrow strip of steep sloped, loess covered hills on its northern edge, with local relief exceeding 200 feet, the topography flattens out to minimally dissected loess covered plain with broad shallow valleys and local relief averaging less than 75 feet. The pre-European settlement prairies are now cropland. Cultivated cropland accounts for 41 percent of the sub-basins land area. Soybeans lead in crop acreage followed by corn. Forage crops are predominantly cool season pastures and hayland and cover 24 percent of the sub-basin. Forest land, much of it second growth, covers 13 percent of the sub-basin. Fourteen percent of the sub-basin's area is developed. Cattle, hogs and horses dominate livestock production.

# Sub-basin Characteristics

## Land Use/Land Cover




*Data Source: Missouri Resource Assessment Partnership, Land Cover Mapping Project, 2002*

| Land Use/Land Cover | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Land Use/ Land Cover** | Developed Land | Cultivated Cropland | Conservation Reserve Program | Noncultivated Cropland | Pastureland | Forest land | Minor land cover/uses | Water | Federal land cover/use not recorded | Rangeland |
| **Acres** | 235,900 | 674,900 | 41,800 | 92,300 | 318,000 | 208,500 | 35,900 | 40,500 | 8,800 | 0 |
| **%** | 14% | 41% | 3% | 6% | 19% | 13% | 2% | 2% | 0% | 0% |

*Data Source: 1997 NRI*

| *Public Land Ownership* | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***Owner*** | *City of Excelsior Springs* | *Jackson Co. Parks & Recreation* | *K.C. Parks & Recreation* | *Missouri Department of Conservation* | *Missouri Department of Natural Resources* | *National Park Service* | *US Fish and Wildlife Service* |
| ***Acres*** | *16.4* | *21.9* | *85.9* | *1,1476.8* | *1,667.0* | *3.0* | *10,114.0* |

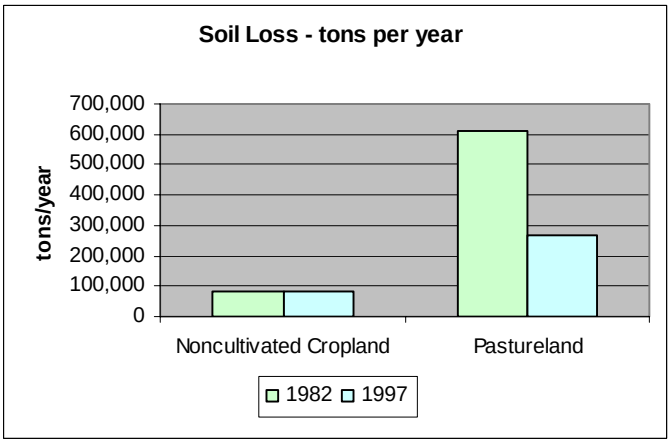
*Data Source: Missouri Resource Assessment Partnership, Public Land Ownership data, 2003*

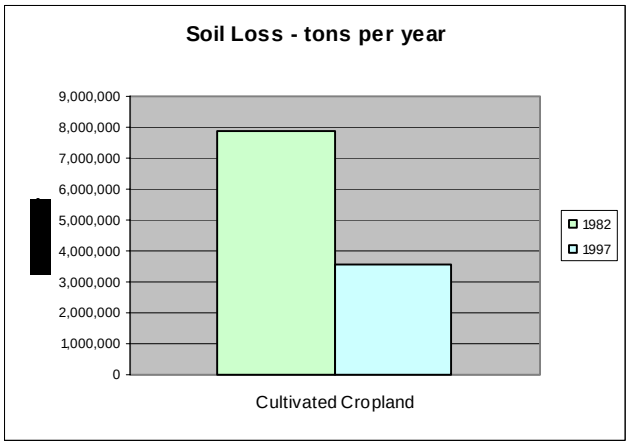
## *Sub-basin Characteristics - continued*

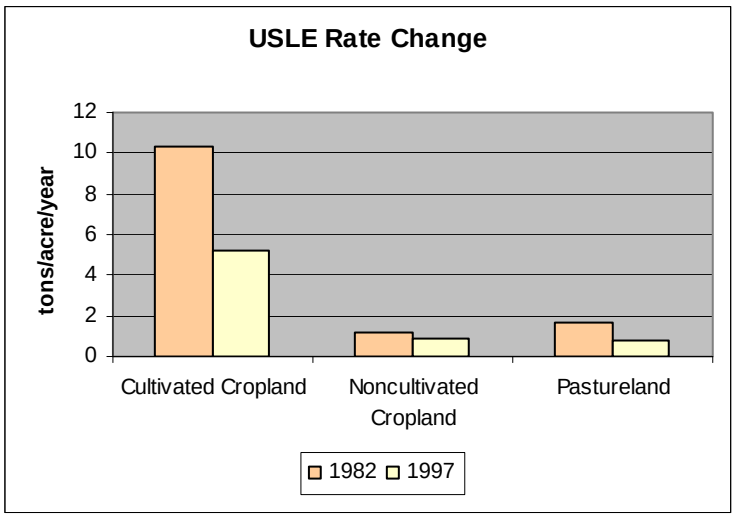
| Irrigated Lands | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Irrigation Water Source | | | | | Irrigation Type | | |
| | Well | Pond, Lake or Reservoir | Stream, Ditch or Canal | Lagoon or other waste water (not including tailwater recovery) | Combination | Gravity | Pressure | Gravity & Pressure |
| **Acres** | 2,500 | - | - | - | - | - | 2,500 | - |
| **% of irrigated lands** | 100% | - | - | - | - | - | 100% | - |
| **% of HUC** | 0% | - | - | - | - | - | 0% | - |

*Data Source: 1997 NRI*

## Soil Erosion



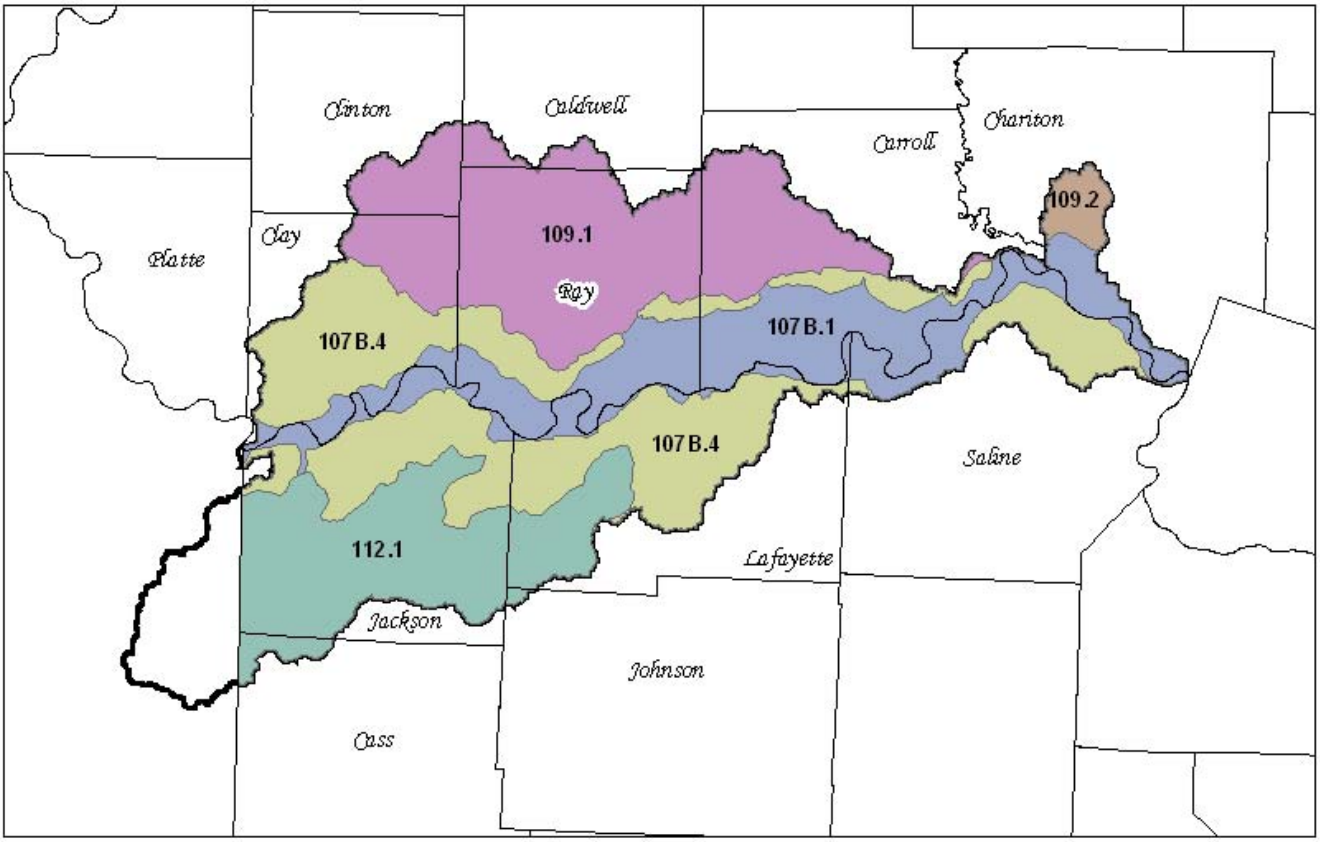

*Data Source: 1997 NRI*

## *Sub-basin Characteristics - continued*

| Land Capability Class | | | | | | |
|---|---|---|---|---|---|---|
| **Class** | **Cultivated Cropland (acres)** | **Cultivated Cropland (%)** | **Noncultivated Cropland (acres)** | **Noncultivated Cropland (%)** | **Pastureland (acres)** | **Pastureland (%)** |
| I - slight limitation | - | - | - | - | - | - |
| II - moderate limitation | 149,400 | 64% | 39,200 | 41% | 163,100 | 31% |
| III - severe limitations | 70,200 | 30% | 39,000 | 40% | 215,400 | 40% |
| IV - very severe limitations | 10,000 | 4% | 18,400 | 19% | 125,800 | 24% |
| V - no erosion hazard, but other limitations | 2,800 | 1% | - | - | 1,300 | 0% |
| VI - severe limitations, unsuited for cultivation, limited to pasture, range, forest | 2,000 | 1% | - | - | 16,500 | 3% |
| VII - very severe limitations, unsuited for cultivation, limited to grazing, forest, wildlife | - | - | 1,500 | 2% | 7,700 | 1% |
| VIII - misc. areas have limitations, limited to recreation, wildlife and water supply | - | - | - | - | 2,500 | 0% |
| Total | 234,400 | - | 96,600 | - | 532,300 | - |

*Data Source: 1997 NRI*

## *Common Resource Areas*



## *Common Resource Areas - continued*

**107B.1 – Missouri River Alluvial Land:** The Missouri River Alluvial Land area consists of the nearly level to gently sloping bottomland and channel of the Missouri River and the Lower Grand River. Native vegetation was largely wet prairie and marshes, with narrow bands and isolated pockets of bottomland forest. The Missouri River channel, which formerly meandered, has been stabilized, narrowed and confined by levees. The major land use is cropland with corn and soybeans being the major crop. Resource concerns are wind erosion, water management and water quality.

**107B.4 – Missouri Loess Hills:** The Missouri Loess Hills CRA is distinguished by a thick loess mantle (10-25 feet) and loess soils. It is a hilly region characterized by broad, rounded ridges, moderate slopes, broad stream valleys and a local relief of 100-150 feet. Bedrock and glacial till are exposed in the deeper valleys. Most of the CRA is in farms, but substantial tracts in the breaks along the Missouri River are thickly wooded.

**109.1 – Grand River Hills:** The Grand River Hills area is gently undulating to steep, dominantly pre-Illinoisan glacial till with a thin cover of loess. Native vegetation was prairie and timber, spatially associated with the pattern of ridges and valleys. The less sloping areas are in cropland, hayland and pasture. Corn and soybeans are the major cash crops. Pastures and woodlands dominate on the more sloping lands. Resource concerns are water erosion, nutrient management, pasture and woodland management and water quality.

**109.2 – Chariton River Hills:** The Chariton River Hills area is gently sloping to hilly formed mostly in glacial till with a thin covering of loess with broad alluvial plains. Native vegetation was a mosaic of upland and wet prairies, savannas and timbered slopes. The less sloping areas are in cropland, hayland and pasture. Corn and soybeans are the major cash crops. Pastures and woodlands dominate on the more sloping lands. Resource concerns are water erosion, nutrient management, pasture and woodland management and water quality.

**112.1 – Scarped Osage Plains:** The Scarped Osage Plains CRA is a smooth plain interrupted by low, ragged escarpments trending southwest-northeast in which limestone bedrock is regularly exposed. Local relief reaches 150 feet in the escarpment zones but elsewhere averages less than 100 feet. Valley bottoms are exceptionally broad for the size of the streams. Geologic parent materials are mainly thin-bedded Pennsylvanian limestones and shales. Pre-settlement vegetation was mostly prairie, with belts of scattered timber along limestone scarps and valleys. Most of the land is in farms, both pasture and cropland. The Kansas City metropolitan area exerts urbanization pressure on the land usein the northwest.

## *Resource Concerns*

| Resource | Concern 1 | Concern 2 | Concern 3 |
|---|---|---|---|
| ***Air*** | Objectionable Odors | | |
| ***Animals (Domestic)*** | Stress & Mortality | | |
| ***Animals (Fish & Wildlife)*** | Inadequate food/cover/water/space | Threatened & Endangered Species | |
| ***Plants*** | Threatened & Endangered Species | Noxious & Invasive Plants | Plant Damage (from wind erosion) |
| ***Soil (Quality)*** | Sheet & Rill Erosion to "T" | | |
| ***Water (Quality)*** | Inefficient water use on irrigated lands | | |
| ***Water (Quantity)*** | Harmful levels of pathogens (livestock source) | Excessive nutrients and organics in surface water | |

*Data Source: Missouri USDA-Natural Resources Conservation Service*

## *Resource Concerns – continued*

| Confined Animal Feeding Operations | | | | |
|---|---|---|---|---|
| **Animal Type** | **Beef** | **Poultry** | **Swine** | **Turkey** |
| **No. of Farms** | | | 1 | |
| **No. of Animal Units** | | | 768 | |

*Data Source: Missouri Department of Natural Resources, National Pollutant Discharge Elimination System (NPDES) Facilities database*

| Threatened & Endangered Species | | | | | |
|---|---|---|---|---|---|
| **Federal** | | **State** | | | |
| Bats | Birds | Bats | Birds | Mammals | Reptiles Amphibians |
| 1 | 1 | 1 | 7 | 1 | 1 |
| E | T | E | E | E | E |

C = Candidate, T = Threatened, E = Endangered

*Data Source: Missouri Department of Conservation, Heritage database*

| Watershed Projects, Plans, Studies & Assessments | | | | | | |
|---|---|---|---|---|---|---|
| # of SALT Projects | Total SALT Watershed Acreage | # of 319 Projects | Total 319 Watershed Acreage | 1999 EQIP Priority Areas | Unified Watershed Assessment Ranking Out of 66 Sub-basins | TMDL Development |
| 5 | 123,574 | 8 | 263,667 | No | 16 | In Progress |

*Data Sources: Soil & Water Conservation Program, Special Area Land Treatment (SALT) Program; Missouri Department of Conservation, Water Protection Program, 319 Non-point Source Implementation Program and TMDL.*

| 303(d) | | | | | | | |
|---|---|---|---|---|---|---|---|
| % of Sub-basin in Missouri | # of 303(d) Pollutants | # of Uses Impaired | Pollutant Sources | Impaired Lake Acreage | Impaired Stream Miles | # of Public Drinking Water Intakes | # of Public Drinking Water Watersheds |
| 94 | 1 | 1 | Non-point | 0 | 22.87 | 5 | 4 |

*Data Source: Missouri Department of Natural Resources, Water Protection Program, Missouri 303(d) Listed Waters, 2002*

## *Progress/Status*

| PRMS Data | FY99 | FY00 | FY01 | FY02 | FY03 | Avg/Year |
|---|---|---|---|---|---|---|
| Total Acres of Conservation Systems Planned | 4,450 | 18,959 | 18,210 | 23,835 | 20,679 | 22,257 |
| Total Acres of Conservation Systems Applied | 7,344 | 43,996 | 32,428 | 29,972 | 26,761 | 28,367 |
| **Conservation Treatment** | | | | | | |
| Buffers (acres) | 76 | 3,257 | 1,191 | 1,637 | 1,345 | 1,491 |
| Erosion Control (acres) | 6,336 | 35,582 | 19,544 | 25,464 | 23,889 | 24,677 |
| Irrigation Mgmt. (acres) | 0 | 0 | 0 | 0 | 2 | 0 |
| Nutrient Mgmt. Applied (acres) | 2,788 | 5,030 | 4,737 | 5,241 | 5,624 | 5,433 |
| Pest Mgmt. (acres) | 2,394 | 4,531 | 4,524 | 3,921 | 6,551 | 5,236 |
| Prescribed Grazing (acres) | 0 | 833 | 481 | 400 | 1,867 | 1,134 |
| Tree & Shrub (acres) | 0 | 183 | 329 | 181 | 350 | 266 |
| Tillage (acres) | 760 | 44,071 | 9,971 | 4,772 | 5,278 | 5,025 |
| Waste (No.) | 0 | 4 | 0 | 1 | 1 | 1 |
| Wetlands (acres) | 95 | 1,954 | 2,248 | 2,603 | 1,045 | 0 |
| Wildlife Habitat (acres) | 96 | 13,681 | 6,115 | 4,518 | 4,397 | 4,458 |

## *Census/Social Data*

- Number of Farms 4,359
- Number of Operators 2,439
- Majority of Farms 50-179 acres in size
- More than 2,250 farms with more than 145,000 cattle and calves.
- More than 57,000 hogs and pigs.
- Nearly 135,000 acres devoted to soybeans.

*(Numbers estimated from 2002 Ag Census data and multiplied by percent of county in watershed)*

*Data Source: National Ag Statistics Service, Ag Census data, 2002*